**Claims**

1. Printing head for squirting out a hot liquid medium, having a diaphragm forming one wall of a medium chamber, and having an actuator in mechanical contact with the diaphragm, **characterized in that** the actuator (11) is thermally decoupled from the diaphragm (7).

2. Printing head according to Claim 1, **characterized in that** the thermal decoupling is performed by a thermal barrier element (26) situated between diaphragm (7) and actuator (11).

3. Printing head according to one of the preceding claims, **characterized in that** the actuator (11) is a piezoelement (15).

4. Printing head according to one of the preceding claims, **characterized in that** the thermal barrier element (26) is an integral part of the piezoelement (15).

5. Printing head according to one of the preceding claims, **characterized in that** the piezoelement (15) has an active and a passive region (24; 25) forming the thermal barrier element (16), in that the active region (24) of the piezoelement (15) has electrodes (22), and in that the passive region (25) is designed without electrodes.

6. Printing head according to one of the preceding claims, **characterized in that** the cross section in the region of the thermal barrier element (26) is smaller than in the remaining region of the actuator (11).

7. Printing head according to one of the preceding claims, **characterized in that** the remaining walls of the medium chamber (8) are formed by a substrate (6) comprising silicon.

8. Printing head according to one of the preceding claims, **characterized in that** the actuator (11) is surrounded by a housing (10).

9. Printing head according to one of the preceding claims, **characterized in that** the actuator

(11) is designed as a lamella and extends between the diaphragm (7) and a housing wall (16) forming an abutment (W) for the actuator 11.

10. Printing head according to one of the preceding claims, **characterized in that** the housing (10) is designed to be electrically insulating and/or to conduct heat poorly.

11. Printing head according to one of the preceding claims, **characterized in that** the housing (10) is produced from a material having a thermal expansion coefficient that is similar, preferably identical, to that of the piezoceramic of the actuator (11).

12. Printing head according to one of the preceding claims, **characterized in that** the diaphragm (7) of the medium chamber (8) forms a housing wall.

13. Printing head according to one of the preceding claims, **characterized in that** the housing (10) is thermally decoupled from the medium chamber (8).

14. Printing head according to one of the preceding claims, **characterized in that** the housing (10) has thermal expansion compensation.

15. Printing head according to one of the preceding claims, **characterized by** a heating device (35) for the medium.

16. Printing head according to one of the preceding claims, **characterized by** a cooling device.

17. Printing head according to one of the preceding claims, **characterized in that** the heating device (35) and/or cooling device is assigned to the medium chamber (8).

18. Printing head according to one of the preceding claims, **characterized in that** the heating and/or cooling device is surrounded by a casing (37).

19. Printing head according to one of the preceding claims, **characterized in that** one wall (34) of the casing (37) is formed by the substrate (6).

20. Printing head according to one of the preceding claims, **characterized in that** the casing (37) is thermally decoupled from the substrate (6).

21. Printing head according to one of the preceding claims, **characterized in that** the medium chamber (8) has at least one, in particular a plurality of squirting-out openings (2) for the hot liquid medium.

22. Printing head according to one of the preceding claims, **characterized by** a protective medium outlet opening (42) for a protective medium which prevents oxidation of the hot liquid medium and forms a protective atmosphere.

23. Printing head according to one of the preceding claims, **characterized in that** that the protective medium outlet opening (42) is provided on the housing (10) of the actuator (11).

24. Printing head according to one of the preceding claims, **characterized in that** the housing (10) has an inlet opening (43) for the protective medium.

25. Printing head according to one of the preceding claims, **characterized in that** the inlet opening (43) and the outlet opening (42) are arranged in the housing (10) in such a way that the actuator (11) is situated, at least in regions, in the flow path of the protective medium.

26. Printing head according to one of the preceding claims, **characterized in that** the thermal decoupling between housing (10) and medium chamber and/or the thermal expansion compensation of the housing is realized by one or a plurality of slots (27) in the housing.

27. Printing head according to one of the preceding claims, **characterized in that** at least one slot (27) serves as the protective medium outlet opening (42).

28. Printing head according to one of the preceding claims, **characterized in that** the slots (27)

form a comb structure (29) on the edge (13) of the housing.

29. Printing head according to one of the preceding claims, **characterized in that** a holding plate (39) for the actuator (11) is provided within the housing (10), the said holding plate lying approximately parallel to the diaphragm (8), and in that the actuator (11) engages through the holding plate (39) with its thermal barrier element (26) facing the diaphragm (8).

30. Printing head according to one of the preceding claims, **characterized in that** the holding plate (39) is held and guided by means of guide bevels (40) designed on the inside of the housing.

31. Printing head according to one of the preceding claims, **characterized in that** the medium chamber (8) is assigned a temperature-detecting device (45) for the medium temperature.

32. Use of a printing head which works according to the ink-jet printing principle and has a thermally decoupled actuator, in particular according to one or more of Claims 1 to 31, for applying metallic solder to a soldering connection point, in particular of a micromechanical and/or microelectronic element.

33. Process for the production of a connection point comprising metallic solder, **characterized in that** the solder is squirted as hot liquid solder onto the contact-making point of the connection point by means of an apparatus which works according to the ink-jet printing principle.

34. Process according to claim 33, **characterized in that** the solder is squirted out as at least one hot liquid drop from the apparatus (printing head 1).

35. Process according to either of claims 33 and 34, **characterized in that** the solder is surrounded by an oxidation protection medium, preferably inert gas, as it is squirted out.

36. Process according to one of claims 33 to 35, **characterized in that** the temperature of the hot liquid

medium present in the apparatus (printing head 1) is detected and monitored.

37. Process according to one of claims 33 to 36, **characterized in that** the apparatus (printing head 1) is subjected to pulsed driving serving for squirting out a plurality of drops.

ADD
A1